

WHAT IS CLAIMED IS:

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1. A component built-in module comprising:
a core layer formed of an electric insulating material;
an electric insulating layer formed on at least one surface of the core layer; and
a plurality of wiring patterns formed on at least one surface of the core layer; wherein:
the electric insulating material of the core layer is formed of a mixture comprising at least an inorganic filler and a thermosetting resin;
at least one or more of active components and/or passive components are contained in an internal portion of the core layer;
the core layer has a plurality of wiring patterns and a plurality of inner vias formed of a conductive resin; and
the electric insulating material formed of the mixture comprising at least an inorganic filler and a thermosetting resin of the core layer has a modulus of elasticity at room temperature in the range from 0.6 GPa to 10 GPa.
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- 20 2. A component built-in module comprising:
a core layer formed of an electric insulating material;
an electric insulating layer formed on at least one surface of the core layer; and
a plurality of wiring patterns formed on at least one surface of the core layer; wherein:
the electric insulating material of the core layer is formed of a mixture comprising at least an inorganic filler and a thermosetting resin;
at least one or more of active components and/or passive components are contained in an internal portion of the core layer;
the core layer has a plurality of wiring patterns and a plurality of inner vias formed of a conductive resin;
the electric insulating material formed of the mixture comprising at least an inorganic filler and a thermosetting resin of the core layer has a modulus of elasticity at room temperature in the range from 0.6 GPa to 10 GPa; and
the thermosetting resin comprises a plurality of thermosetting resins having different glass transition temperatures.
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3. A component built-in module comprising:
a core layer formed of an electric insulating material;
an electric insulating layer formed on at least one surface of the core
5 layer; and
a plurality of wiring patterns formed on at least one surface of the core
layer; wherein:
the electric insulating material of the core layer is formed of a mixture
comprising at least an inorganic filler and a thermosetting resin;
10 at least one or more of active components and/or passive components
are contained in an internal portion of the core layer;
the core layer has a plurality of wiring patterns and a plurality of
inner vias formed of a conductive resin;
the electric insulating material formed of the mixture comprising at
15 least an inorganic filler and a thermosetting resin of the core layer has a
modulus of elasticity at room temperature in the range from 0.6 GPa to 10
GPa; and
the thermosetting resin comprises at least a thermosetting resin
having a glass transition temperature in the range from -20°C to 60°C and a
20 thermosetting resin having a glass transition temperature in the range from
70°C to 170°C.

4. The component built-in module according to any one of claims 1 to 3,
comprising a through hole that extends through all of the core layer, the
25 electric insulating layer and the wiring pattern.

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5. The component built-in module according to any one of claims 1 to 3,
comprising a core layer formed of an electric insulating material; an electric
insulating layer comprising an electric insulating material formed of a
30 mixture including an inorganic filler and a thermosetting resin, which is
formed on at least one surface of the core layer; and a plurality of wiring
patterns formed of a copper foil; wherein the core layer has a plurality of
wiring patterns formed of a copper foil and a plurality of inner vias formed of a
conductive resin, and the wiring patterns are connected electrically to each
35 other by the inner vias.

6. The component built-in module according to any one of claims 1 to 3,

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5 comprising a core layer formed of an electric insulating material; an electric insulating layer comprising an insulating material formed of a thermosetting resin, which is formed on at least one surface of the core layer; and a plurality of wiring patterns formed by copper-plating; wherein the core layer has a plurality of wiring patterns formed of a copper foil and a plurality of inner vias formed of a conductive resin, and the wiring patterns formed by the copper-plating are connected electrically to each other by the inner vias.

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10 7. The component built-in module according to any one of claims 1 to 3, comprising a core layer formed of an electric insulating material; an electric insulating layer formed of an organic film having thermosetting resins on both surfaces, which is formed on at least one surface of the core layer; and a plurality of wiring patterns formed of a copper foil; wherein the core layer has a plurality of wiring patterns formed of a copper foil and a plurality of inner
15 vias formed of a conductive resin, and the wiring patterns are connected electrically to each other by the inner vias.

20 8. The component built-in module according to any one of claims 1 to 3, comprising a core layer formed of an electric insulating material; and a ceramic substrate having a plurality of wiring patterns and inner vias adhered onto at least one surface of the core layer; wherein the core layer has a plurality of wiring patterns formed of a copper foil and a plurality of inner vias formed of a conductive resin.

25 9. The component built-in module according to any one of claims 1 to 3, comprising a core layer formed of an electric insulating material; and a plurality of ceramic substrates having a plurality of wiring patterns and inner vias adhered onto at least one surface of the core layer; wherein the core layer has a plurality of wiring patterns formed of a copper foil and a plurality of
30 inner vias formed of a conductive resin; and the plurality of ceramic substrates comprise dielectric materials having different dielectric constants.

35 10. The component built-in module according to any one of claims 1 to 3, wherein a film-shaped passive component is disposed between the wiring patterns formed on at least one surface of the core layer.

11. The component built-in module according to claim 10, where the film-

shaped passive component is at least one selected from the group consisting of a resistor, a capacitor and an inductor formed of a thin film or a mixture comprising an inorganic filler and a thermosetting resin.

- 5 12. The component built-in module according to claim 10, where the film-shaped passive component is a solid electrolytic capacitor formed of at least an oxide layer of aluminum or tantalum and a conductive macromolecule.

- 10 13. A method for producing a component built-in module, comprising:
processing a mixture comprising at least an inorganic filler and an uncured state thermosetting resin into a sheet;
providing the sheet comprising an inorganic filler and an uncured state thermosetting resin with a through hole;
filling the through hole with a conductive resin;
15 mounting an active component and/or passive component on a copper foil;
superimposing the sheet in which the through hole is filled with a conductive resin onto the surface of the copper foil on which the components are mounted;
20 furthermore superimposing a copper foil;
burying the active and/or passive component in the sheet, followed by heating and pressing the sheet material, thereby curing the thermosetting resin and the conductive resin in the sheet;
then processing the copper foil on the outermost layer into a wiring
25 pattern, thereby forming a core layer;
providing a through hole in a sheet comprising an inorganic filler and an uncured state thermosetting resin or an organic film having adhesive layers on both surfaces;
superimposing a copper foil, and the sheet or the organic film in which
30 the through hole is filled with a conductive resin onto at least one surface of the core layer, followed by heating and pressing thereof so as to be integrated onto each other; and
processing the copper foil into a wiring pattern.

- 35 14. The method for producing the component built-in module according to claim 13, wherein a film-shaped component is formed beforehand on the copper foil that is to be superimposed onto the core layer.

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15. A method for producing a component built-in module comprising:
processing a mixture comprising at least an inorganic filler and an
uncured state thermosetting resin into a sheet;
5 providing a through hole in the sheet comprising an inorganic filler
and an uncured state thermosetting resin;
filling the through hole with a conductive resin;
forming a wiring pattern on one surface of a release carrier;
mounting an active component and/or passive component on the
10 wiring pattern of the release carrier;
superimposing the sheet in which the through hole is filled with a
conductive resin onto the surface of the release carrier having a wiring
pattern on which the component is mounted;
burying and integrating the active component and/or passive
15 component into the sheet, followed by further heating and pressing thereof,
thereby curing the thermosetting resin and the conductive resin in the sheet
material;
then peeling off the release carrier on the outermost portion, thereby
forming a core layer;
20 providing a through hole in a sheet comprising an inorganic filler and
an uncured state thermosetting resin or an organic film having adhesive
layers on both surfaces;
superimposing the release carrier having a wiring pattern on one
surface, and the sheet or the organic film in which the through hole is filled
25 with the conductive resin onto at least one surface of the core layer, followed
by heating and pressing thereof so as to be integrated into each other; and
peeling off the release carrier.
16. The method for producing the component built-in module according to
30 claim 15, wherein a film-shaped component is formed on the wiring pattern
formed beforehand on the release carrier on which the wiring pattern is
formed to be superimposed onto the core layer.

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- 35 17. The method for producing the component built-in module according to
claim 14 or 16, wherein the film-shaped component is at least one selected
from the group consisting of a resistor, a capacitor and an inductor, which is
formed of a thin film or a mixture comprising an inorganic filler and a

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thermosetting resin; and the film-shaped component is formed by one method selected from the group consisting of vapor deposition method, MO-CVD method or a thick film printing method.

- 5 18. A method for producing a component built-in module comprising:
processing a mixture comprising at least an inorganic filler and an
uncured state thermosetting resin into a sheet;
providing a through hole in the sheet comprising an inorganic filler
and an uncured state thermosetting resin;
10 filling the through hole with a conductive resin;
mounting an active component and/or passive component on a copper
foil;
superimposing the sheet in which the through hole is filled with a
conductive resin onto the surface of the copper foil on which the components
15 are mounted;
further superimposing a copper foil;
burying the active and/or passive component in the sheet, followed by
heating and pressing the sheet material, thereby curing the thermosetting
resin and the conductive resin in the sheet;
20 then processing the copper foil on the outermost layer into a wiring
pattern, thereby forming a core layer;
providing a through hole in a sheet comprising an inorganic filler and
an uncured state thermosetting resin or an organic film having adhesive
layers on both surfaces;
25 superimposing the copper foil, and the sheet or the organic film in
which the through hole is filled with a conductive resin onto at least one
surface of the core layer, followed by heating and pressing thereof so as to be
cured; and
then forming a through hole that extends through the core layer so as
30 to form a through hole by copper-plating.
19. A method for producing a component built-in module comprising:
processing a mixture comprising at least an inorganic filler and an
uncured state thermosetting resin into a sheet;
35 providing a through hole in the sheet comprising an inorganic filler
and an uncured state thermosetting resin;
filling the through hole with a conductive resin;

forming a wiring pattern on one surface of a release carrier;
mounting an active component and/or passive component on the
wiring pattern of the release carrier;

5 superimposing the sheet in which the through hole is filled with a
conductive resin onto the surface of the release carrier having a wiring
pattern on which the component is mounted;

burying and integrating the active component and/or passive
component into the sheet, followed by further heating and pressing thereof,
thereby curing the thermosetting resin and the conductive resin in the sheet;
10 then peeling off the release carrier on the outermost portion, thereby
forming a core layer;

providing a through hole in a sheet comprising an inorganic filler and
an uncured state thermosetting resin or an organic film having adhesive
layers on both surfaces;

15 superimposing the release carrier having a wiring pattern on one
surface, and the sheet or the organic film in which the through hole is filled
with a conductive resin onto at least one surface of the core layer, followed by
heating and pressing thereof so as to be cured; and

then forming a hole that extends through the core layer and carrying
20 out copper-plating thereof to form a through hole.

20. A method for producing a component built-in module comprising:
processing a mixture comprising at least an inorganic filler and an
uncured state thermosetting resin into a sheet;

25 providing a through hole in the sheet comprising an inorganic filler
and an uncured state thermosetting resin;

filling the through hole with a conductive resin;

forming a wiring pattern on one surface of the release carrier;

30 mounting an active component and/or passive component on a wiring
pattern of the release carrier;

superimposing the sheet material in which the through hole is filled
with a conductive resin onto the surface of the release carrier having a wiring
pattern on which the components are mounted;

35 further superimposing a copper foil and heating and pressing in the
temperature range in which the thermosetting resin is not cured;

burying and integrating the active components and/or passive
components into the sheet, thereby forming a core layer;

peeling off the release carrier from the core layer; and
superimposing the ceramic substrate in which at least two or more of
inner vias and wiring patterns are laminated onto at least one surface of the
core layer from which the release carrier is peeled off, followed by pressing
5 thereof, thereby curing the thermosetting resin in the core layer to be adhered
to the ceramic substrate.

21. The method for producing a component built-in module according to
claim 20, wherein a plurality of ceramic substrates having a plurality of
10 wiring patterns and the inner vias are laminated simultaneously via the core
layer and the adhesive layer.

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